



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,607	04/19/2001	Cord F. Stahler	100564-00049	3440

6449 7590 09/26/2005

ROTHWELL, FIGG, ERNST & MANBECK, P.C.  
1425 K STREET, N.W.  
SUITE 800  
WASHINGTON, DC 20005

EXAMINER

PONNALURI, PADMASHRI

ART UNIT PAPER NUMBER

1639

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/763,607

Applicant(s)

STAHLER ET AL.

Examiner

Padmashri Ponnaluri

Art Unit

1639

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11, 13-23 and 27-56 is/are pending in the application.
- 4a) Of the above claim(s) 53-55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-23, 27-52, 56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The amendment and the response filed on 7/21/05 has been fully considered and entered into the application.
2. Claims 12 and 24-26 have been canceled and new claims 28-56 have been added by the amendment filed on 7/21/05.
3. Claims 1-11, 13-23, 27-56 are currently being examined in this application.
4. Claims 53-55 (depend on the non-elected claims 24-26) are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 6/2/03. The new claims 53-55 are dependent on canceled and non-elected claims 24-26. Applicants are requested to cancel the claims.
5. Claims 1-11, 13-23, 27-52 and 56 are currently pending and are being examined in this application.

### ***Priority***

6. This application is a national stage application of PCT/EP99/06316, filed on 8/27/99.
7. Acknowledgment is made of applicant's claim for foreign priority based on several applications filed in Germany on 8/28/98; 8/19/99 and 5/27/99. It is noted, however, that applicant has not filed English translation of the German priority applications as required by 35 U.S.C. 119(b).

### ***Specification***

8. The abstract filed on 7/21/05 has been fully considered.

Art Unit: 1639

9. The objection to the disclosure set forth in the previous office action mailed on 1/21/05 have been withdrawn in view of the amendment to the specification.

***Claim Objections***

10. The objection to the claims 4-11, 13-22 set forth in the previous office action has been withdrawn in view of the amendment.

***Status of the Claim Rejections***

11. The rejection of claims 1-23 and 27 under 35 U.S.C. 112, second paragraph has been withdrawn in view of the amendments to the claims.

12. The rejection of claims 1-23 and 27 under 35 U.S.C. 102(e) as being anticipated by US Patent 6,271,957 B1 (Quate et al ) (filing date 5/26/99, effective filing date 5/29/98) has been maintained for the reasons of record. The rejection over Quate et al reads on the new claims 28-52 and 56 for the reasons set forth below in the response to the arguments.

13. The rejection of claims 1-23 and 27 under 35 U.S.C. 102(e) as being anticipated by US Patent 6,375,903 B1 (Cerrina et al) (effective filing date 2/23/98) has been maintained for the reasons of record. The rejection over Cerrina et al reads on the new claims 28-52 and 56 for the reasons set forth below in the response to the arguments.

14. The provisional obviousness-type double patenting rejection of claims 1-23 and 27 over US Patent applications 09/763,914 and 10/727,566 has been maintained for the reasons of record.

***New Claim Rejections Necessitated by the amendment***

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 1639

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 47 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 47 recites the limitation "said semiconducting material". There is insufficient antecedent basis for this limitation in the claim or in claim 9.

### ***Response to Arguments***

16. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

A) *Claims 1-23 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,271,957 B1 (Quate et al) (filing date 5/26/99, effective filing date 5/29/98).*

*The instant claim briefly recites a method for preparing a carrier (biochip) coated with biologically or chemically functional materials, comprising a) providing a carrier having a surface which has photoactivatable groups; b) activating the photoactivatable groups on at least on a predetermined area of the carrier surface by location specific exposure of the carrier using an illumination matrix; c) location specific binding of biologically or chemically functional materials or building blocks; d) repeating the activation and binding steps on the same or different predetermined areas.*

*Note that in the instant claims 'where appropriate' is not considered as required feature; 'or/and' is considered as 'or'; 'namely' is considered as 'for example'.*

*Quate et al teaches methods involving direct write optical lithography. The reference teaches that polymer array (refers to the biological or chemical materials of the instant claims) synthesis is performed using a system without using a photo mask (i.e., see abstract). The reference teaches that the optical*

Art Unit: 1639

*lithography system uses a spatial light modulator to generate unique predetermined image patterns at each photolithographic step in polymer array synthesis, and the spatial light modulators can be micro machined mechanical modulators (refers to the instant claim micro mechanical mirror array) (i.e., see column 3, lines 28). The reference teaches that the polymers synthesized by the method (refers to the instant claim 14) (see i.e., column 3, lines 33-35). The reference claims are drawn to a method for deprotecting reaction sites on a substrate comprising: providing a substrate having protected reaction site; modulating light direction with spatial modulator so as to generate a predetermined light pattern used for deprotection selected portions of said protected reaction sites (refers to instant claim steps a and b).*

*The reference teaches that certain preferred embodiments of the invention involves the use of micro machined mechanical modulators (micro mirror array) (refers to the instant claims 5-6) to direct light to predetermined regions of the substrate (refers to 'predetermined area of the carrier) (i.e., see column 3).*

*The reference teaches one type of mechanical modulator is a micro-mirror array which uses a small metal mirrors to selectively reflect a light beam to a particular individual features. And the reference teaches programmable micro-mirror array Digital Micro-mirror device (DMD) (i.e., see column 3). The reference teaches that DMD array consists of 640 x 480 mirrors or 800 X 600 mirrors, and each mirror is 16  $\mu\text{m}$  x 16  $\mu\text{m}$  which would read on the activated area of the instant claims (i.e., see column 4). The reference teaches that polymer array is synthesized with a programmable micro-mirror array using DMT process, in which a computer file is generated and specifies, for each photolithography step, which mirrors in the micro-mirror array need to be on and which need to be off to generate a particular predetermined image pattern (i.e., see column 5). The reference teaches that the exposure of the wafer (chip) to acid then cleaves the DMT protecting groups from regions of the wafer where the photoresist has been removed. The remaining photoresist is then stripped, and the DMT (acid labile protecting groups) protected nucleotides containing the desired base are coupled to the deprotected oligonucleotides (refers to the instant claim steps c-d) (i.e., see column 5). The reference teaches that the direct write optical system is also applicable to performing a process of deprotection of reaction sites using the DPD and PAG methods without the photoresist (refers to the photoactivatable groups of the instant claims) (i.e., see column 6). The reference further teaches that the polymer array synthesis processing can be performed using photo acid generators without using photoresist, e.g., using PAG process or DPD process (i.e., see column 6).*

Art Unit: 1639

*The reference teaches that one skilled in the art will choose the spatial modulator that is compatible with the chosen wavelength of illumination and synthesis chemistries employed. And the reference further teaches that DMD could be used in the invention with UV light. The reference teaches that a lens 12 images the micro mirror array (DMD or GLV) onto an array having an array of microlenses or non-imaging light concentrators. Each element of the array focuses light onto the chip or wafer, each micro-lens produces an image of pixel of the micro array (i.e., see column 7).*

*The reference teaches that some spatial light modulators are designed to modulate transmitted rather than reflected light, and an example of transmissive spatial light modulator is a liquid crystal display (LCD) (refers to the instant claim 'light source of illumination matrix') (i.e., see column 8). Thus, the reference clearly anticipates the claimed invention.*

17. Applicant's arguments filed on 7/21/05, regarding the rejection of claims over Quate et al (US Patent 6,271,957 B1) have been fully considered but they are not persuasive.

Applicants argue that Quate et al nowhere discloses or even suggests either monitoring or control by means of light sensor matrix.

Applicants arguments have been considered and are not persuasive, because even if the claim is amended to include the limitation, Quate et al teach light modulator (refers to the illumination matrix) and a computer (refers to the 'means of a light source' of the instant claims) providing electronic control signals to the light modulator through cables so as to transmit a desired image (refers to the controlled image) (i.e., see column 8). The independent new claim 56 has been included in this rejection because the claim is almost same in scope as the rejected claim 1. Quate et al teach the 'light sensor matrix' of the claim 28. Quate refers to the US Patent 6,136,269 and incorporated the disclosure of the patent (i.e. see column 9). The '269 patent discloses high-density arrays, and further discloses the predefined area or region to  $0.5 \mu\text{m}^2$  to  $1 \text{cm}^2$ . Quate et al teach the micro mirror array is programmed for the appropriate configuration

Art Unit: 1639

according to the desired predetermined pattern, the chip is illuminated for the desired amount of time (refers to the rate of the illumination). Quate et al teach the medications of the passivation layer, such that light modulators DMD can be used with UV light. The UV light refers to the monochromatic radiation of the instant claim 30. Thus, the rejection of record has been maintained for the reasons of record.

Applicants further arguments regarding the priority date of the Quate patent have been considered. Applicants argue that the priority application of the Quate et al reference does not teach the limitations of claim 27. Applicants arguments have been considered and are not persuasive. Even if Quate reference has only effective filing date of 5/26/99, it is still a prior art, since in the instant application, applicants have not provided English language translations for the German or priority documents to get the priority date. Thus the rejection of record has been maintained for the reasons of record.

*B) Claims 1-23 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,375,903 B1 (Cerrina et al) (effective filing date 2/23/98).*

*The instant claim briefly recites a method for preparing a carrier (biochip) coated with biologically or chemically functional materials, comprising a) providing a carrier having a surface which has photoactivatable groups; b) activating the photoactivatable groups on at least on a predetermined area of the carrier surface by location specific exposure of the carrier using an illumination matrix; c) location specific binding of biologically or chemically functional materials or building blocks; d) repeating the activation and binding steps on the same or different predetermined areas.*

*Note that in the instant claims 'where appropriate' is not considered as required feature; 'or/and' is considered as 'or'; 'namely' is considered as 'for example'.*



*Cerrina et al teach synthesis of arrays of DNA probe sequences, polypeptides, and the like is carried out rapidly and efficiently using patterning process, and the process is automated or computer controlled (i.e., see column 2). The reference teaches that the according the present synthesis, a substrate with an active surface to which DNA synthesis linkers have been applied to use support the probes that are to be fabricated. To activate the active surface of the substrate to provide the first level of bases, a high precision two dimensional light image is projected onto the substrate (refers to the predetermined area of the instant claims), illuminating those pixels in the array on the substrate active surface which are to be activated to bind a first base. The light incident on the pixels in the array to which light is applied deprotects OH groups and makes them available for binding of bases. After this development step, a fluid containing the appropriate base is provided to the active surface of the substrate and selected base binds to the exposed sites. The process is the repeated to bind another base to a different set of pixel locations, until all the elements of the two-dimensional array on the substrate have an appropriate base bound thereto (refers to the instant claim method) (i.e., see column 2).*

*The reference teaches that the image is projected onto the substrate utilizing an image former having an appropriate light source that provides light to a micro-mirror device comprising two dimensional array of electronically addressable mirrors, each of which can be tilted between one of at least two separate positions (refers to the 'illumination matrix'; 'reflection matrix'; and 'micro mechanical mirror arrays' of the instant claims) (i.e., see column 3). The reference teaches that the micro mirrors are capable of reflecting light at any wavelength without damage to them, allowing short wavelength lighting, including the light in the range of ultraviolet light (refers to the 'electromagnetic radiation which is in UV range' of the instant claims) (i.e., see column 3). The reference teaches that the micro-mirror is under control of a computer which provides appropriate pixel address signals to the micro-mirror array to cause appropriate micro-mirrors in their 'reflect' or 'deflect' positions (refers to the light sensor matrix of the instant claims) (i.e., see column 3). The reference teaches that the substrate may be transparent (i.e., see column 3).*

*The reference teaches the apparatus that is used for DNA probe array synthesis, polypeptide synthesis is shown in figure 1., which includes a two-dimensional array image former, a substrate; and the image former includes a light source (e.g., an ultraviolet or near ultraviolet source (i.e., see column 4, figure 1); a micro-mirror array device; a computer controller.*

Art Unit: 1639

*The reference teaches that digital micro-mirror device (DMD) which are typically used for video projection are available in various sizes, 640 X 800 micro mirror elements, which are capable of reflecting the light of normal usable wavelengths, including ultraviolet and near ultraviolet light (i.e., see column 5). The reference teaches a glass substrate (refers to the instant claim 9) (i.e., see column 6). The reference in figures 9-14 depicts the process of forming DNA probes. The reference teaches that the substrate having a silane layer is coated with a photolabile linker molecule to form an active surface (refers to the substrate with photoactivatable groups of the instant claims). Figure 10 illustrates the photo-deprotection of the MENPOC-HEG linker and the production of free OH groups. The reference clearly anticipates the claimed invention.*

18. Applicant's arguments filed on 7/21/05, regarding the rejection of claims over Cerrina et al have been fully considered but they are not persuasive.

Applicants argue that Cerrina et al do not disclose or suggest any monitoring or light sensor component. Applicants arguments have been considered and are not persuasive because the reference teaches that the micromirror is under control of a computer which provides appropriate pixel address signals to the micromirror array to cause appropriate micro mirrors in their reflect or deflect positions (which refers to the instant claim limitation 'controlled by means' or 'UV source is controlled.'). Further Cerrina et al teach UV source used in the reference device and method. Thus, it is inherent from the reference disclosure that any type or source of UV light can be used with the disclosed method, and reads on the Markush list UV sources claimed in claim 27. The reference clearly anticipates the new claim 56, since the new claim 56 is same in scope as the rejected claim 1. Thus, the rejection of record has been maintained.

C) *Claims 1-23, 27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-36 of copending Application No. 09/763,914. Although the conflicting claims are not identical, they are not patentably distinct from each other because the reference method*

Art Unit: 1639

*for producing a support for determining analytes is very generic and does not recite how 'site and/or time-specifically immobilizing the receptor building blocks in each case on predetermined positions in the channel or channels by illumination...' (step c). However the instant claimed method for preparing a carrier coated with biologically or chemically functional materials (refers to the 'receptors or building blocks' of the reference) recites the same exact method steps, except that the instant claims recite how the building blocks or the receptor are bound to the substrate at predetermined positions. The reference support reads on the instant claim support; and the reference nucleic acids or nucleic acid analogs (claim 5), polypeptides (claim 6), amino acids (claim 8) reads on the instant claim biological functional materials (claim 14); and 'illumination matrix' (claim 8) reads on the 'illumination matrix' of the instant claims; the support is optically transparent (claim 24) refers to the instant claim 9; the apparatus further comprises electronic control means refers to the controller. Thus the claimed method is obvious variant of the reference method.*

*This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.*

*Claims 1-23, 27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-38 of copending Application No. 10/727,566. Although the conflicting claims are not identical, they are not patentably distinct from each other because the reference method for producing a support for determining analytes is very generic and does not recite how 'site and/or time-specifically immobilizing the receptor building blocks in each case on predetermined positions in the channel or channels by illumination...' (step c). However the instant claimed method for preparing a carrier coated with biologically or chemically functional materials (refers to the 'receptors or building blocks' of the reference) recites the same exact method steps, except that the instant claims recite how the building blocks or the receptor are bound to the substrate at predetermined positions. The reference support reads on the instant claim support; and the reference nucleic acids or nucleic acid analogs (claim 5), polypeptides (claim 6), amino acids (claim 8) reads on the instant claim biological functional materials (claim 14); and 'illumination matrix' (claim 8) reads on the 'illumination matrix' of the instant claims; the support is optically transparent (claim 24) refers to the instant claim 9; the apparatus further comprises electronic control means refers to the controller. Thus the claimed method is obvious variant of the reference method.*

Art Unit: 1639

*This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.*

19. Applicant's arguments filed 7/21/05 regarding the Obviousness-type double patenting rejections supra have been fully considered. Applicants agreed to file an appropriate terminal disclaimer over any conflicting claims should any of these claims be granted. The Obviousness-type double patenting rejection would be withdrawn upon filing and entering of the terminal disclaimer.

### ***Conclusion***

20. No claims are allowed.

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 1639

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Padmashri Ponnaluri whose telephone number is 571-272-0809. The examiner is on Increased Flex Schedule and can normally be reached on Monday through Friday between 7 AM and 3.30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**PADMASHRI PONNALURI**  
**PRIMARY EXAMINER**

Padmashri Ponnaluri  
Primary Examiner  
Art Unit 1639

21 September 2005